**WHAT IS CLAIMED IS:**

1      1.      A device for controlling a video game, comprising:

2      an input having a movable reference surface;

3      an imager operable to capture images of the reference surface; and

4      a movement detector operable to detect movement of the reference surface

5 based on one or more comparisons between images of the reference surface

6 captured by the imager and to generate output signals for controlling the video

7 game based on the detected movement.

1      2.      The device of claim 1, wherein the input is a joystick and the

2 reference surface moves in response to movement of the joystick.

1      3.      The device of claim 2, wherein the input comprises a joystick shaft

2 having a lower portion coupled to a base, and the reference surface corresponds

3 to an area on the lower portion of the joystick shaft.

1      4.      The device of claim 3, wherein the base includes a socket and the

2 lower portion of the joystick shaft includes a spherical element positioned in the

3 base socket and having a surface region corresponding to the reference surface.

1      5.      The device of claim 1, wherein the input comprises a steering wheel

2 coupled to a base through a steering column, and the reference surface tracks

3 movement of the steering column.

1      6.      The device of claim 5, wherein the reference surface corresponds to

2 a surface of the steering column.

1      7.      The device of claim 1, wherein the imager includes multiple image

2 sensors each operable to capture images of the reference surface.

1      8.      The device of claim 1, wherein the movement detector is operable to

2 detect movement of the reference surface by tracking features of the reference

3 surface across multiple images.

1        9.    The device of claim 8, wherein the movement detector is operable to

2    track structural features of the reference surface across multiple images.

1        10.    The device of claim 8, wherein the movement detector is operable to

2    compute position coordinates for the reference surface by correlating features of

3    the reference surface across multiple images.

1        11.    The device of claim 10, wherein the movement detector is operable

2    to map the computed position coordinates to the output signals for controlling the

3    video game.

1        12.    The device of claim 1, further comprising at least one light source

2    for illuminating the reference surface.

1        13.    A device for controlling a video game, comprising:

2    a movable input;

3    an imager attached to the input and operable to capture images of a scene

4    in the vicinity of the input; and

5    a movement detector operable to compute three-dimensional position

6    coordinates for the input based at least in part on one or more comparisons

7    between images of the scene captured by the imager and to generate output

8    signals for controlling the video game based on the computed position

9    coordinates.

1        14.    The device of claim 13, wherein the movement detector is operable

2    to compute rotational position of the movable input based at least in part on one

3    or more comparisons between images of the scene captured by the imager.

1        15.    The device of claim 13, wherein the input is a device for simulating

2    a sports game.

1        16.    The device of claim 15, wherein the input is formed in the shape of

2    a glove.

1        17.    The device of claim 13, further comprising an acceleration sensor

2    unit attached to the input and operable to generate signals indicative of

3 movement of the input in three-dimensions, wherein the movement detector is

4 operable to detect movement of the input based at least in part on the signals

5 generated by the acceleration sensor.

1       18.     The device of claim 17, wherein the movement detector is operable

2 to compute coarse three-dimensional position coordinates for the input based on

3 the signals received from the acceleration sensor unit and to compute refined

4 three-dimensional position coordinates for the input based on the computed

5 coarse three-dimensional position coordinates and comparisons between images

6 of the scene captured by the imager.

1       19.     The device of claim 17, wherein the movement detector is operable

2 to periodically correct three-dimensional position coordinates for the input

3 computed from signals generated by the acceleration sensor based on position

4 coordinates computed from comparisons between images of the scene captured

5 by the imager.

1       20.     The device of claim 17, wherein the movement detector is operable

2 to compute acceleration information relative to position information computed

3 from comparisons between images of the scene captured by the imager.

1       21.     The device of claim 17, wherein the movement detector is operable

2 to compute a measure of movement rate of the movable input based on the

3 signals received from the acceleration sensor unit, and the imager captures images

4 of the scene at a variable rate that is set based on the computed movement rate

5 measure.

1       22.     The device of claim 13, wherein the movement detector is operable

2 to detect movement of the input by tracking features of the scene across multiple

3 images.

1       23.     The device of claim 13, wherein the movement detector is operable

2 to compute position coordinates for the reference surface by correlating features

3 of the reference surface across multiple images.

1      24.     The device of claim 13, wherein the movement detector is operable

2 to map the computed position coordinates to the output signals for controlling the

3 video game.